



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,191	03/24/2004	Michinari Yamanaka	60188-809	1823

7590 09/27/2006

Jack Q. Lever, Jr.  
McDERMOTT, WILL & EMERY  
600 Thirteenth Street, N.W.  
Washington, DC 20005-3096

EXAMINER

KACKAR, RAM N

ART UNIT PAPER NUMBER

1763

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/807,191

Applicant(s)

YAMANAKA, MICHINARI

Examiner

Ram N. Kackar

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 16-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 1-4, 6-15 and 22-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Amended claims 1 and 6 are still indefinite for the following reasons:

In this instance the surface area of the shield device is indefinite since it is claimed to be determined by an opening area ratio while the basis of that determination is not defined.

*(Note: The basis of determination could be equal, greater than, smaller than, a mathematical relation ship or a combination of these).*

Further, even if a relationship to satisfy the above requirement is found, a comparison to an object that is variable may render a claim indefinite (See MPEP 2173.05(b)).

In this instance variable object is the opening area ratio, (0- 80%).

Still further, expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

In this instance opening area ratio pertains to a substrate or a work piece (*content*) to be worked upon in the claimed apparatus.

Claims 14, 22 and 23 are indefinite since it depends upon claim 6 but is indefinite on its own for additional reason as discussed below:

Claim 14 recites a component of the shield ring as being same material as the object to be etched. As discussed above in regards to claims 1 and 6 claim 14 is indefinite since expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Claims 22 and 23 are not patentable for similar reason.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-4, 6-15 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ke et al (US 6284093).**

Ke et al disclose a chamber having gas inlet and outlet, a place for setting an object to be etched, a circular shield (focus ring 50 of silicon) and upper and lower electrodes (Fig 2).

Regarding claim 6 Ke et al disclose multipart shield ring (Fig 2 to Fig 8B) where at least one part is silicon and other part could be a different material like quartz (Col 3 lines 17-19). Ke et al teach that silicon scavenges fluorine ions and controls etch selectivity in an SiO<sub>2</sub> etch (Col 8 lines 3-27) and further teach that large surface area of silicon shield ring improves the selectivity of etch process (Col 8 lines 51-59).

It is to be noted that this reasoning as discussed above (*In prior art*) is the reasoning discussed in the specification which forms the basis of surface area of the ring affecting etch selectivity.

As known by one of ordinary skill in the art, etching of small opening requires large selectivity, the surface area of the shield provides a result effective parameter to optimize etch selectivity (See MPEP 2144.05 II B).

Therefore it would have been obvious to use shield surface area as a control parameter for optimizing etch selectivity, which may be useful, especially for small opening etch.

Claims 22 and 23 are not patentable since expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

### ***Response to Arguments***

Applicant's arguments filed 8/3/2006 have been fully considered but they are not persuasive.

Claims 1-15 are still indefinite for the reasons discussed above.

Applicant's arguments against the rejection dependent upon AAPA is misplaced. The point which did not get across is that since the opening could be 0 (none) –100% (whole surface etch) an opening %age could be found so that surface area determined for that opening would be same as given by AAPA.

Regarding Ke applicant argues that the linkage between the opening area ratio and the surface area of the shield device is solely provided by the specification of the invention.

Art Unit: 1763

This point is not correct since Ke et al not only teach this linkage (one affecting other) (Col 7 lines 65- Col 8 line 14) but explain the mechanism whereby silicon of the shield controls the fluorine ions and thereby the selectivity. For example photo resist etch is reduced so that the shape of the etch is affected. Similarly the selectivity towards oxide is affected by the number of fluorine ions with respect to other fluorine containing reagents. It is known that high selectivity of etch is critical for high aspect ratio etch (low opening ratio).

Further, the claims do not show how the size is determined precisely. Just claiming that they are somehow related is not enough to make the claims definite as discussed above.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

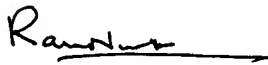
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 1763

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ram Kackar  
Primary Examiner AU 1763